

Ser. No.: 10/519,000
Amdt. dated June 13, 2008
Reply to Final Office Action of February 14, 2008

PATENT
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Remarks/Arguments

The Office Action mailed February 14, 2008 has been reviewed and carefully considered.

Reconsideration of the above-identified application, as herein amended and in view of the following remarks, is respectfully requested. Claims 1-22 remain pending in the application.

Claim Rejections

Claims 1, 11-14 and 20-21 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,245,667 to Lew. Lew discloses a method and structure for synchronizing multiple, independently generated digital audio signals. Initially, applicants would like to re-iterate a point made in a previous response. The disclosure of Lew relies entirely on Phase Lock Loops (PLLs) to generate the master sampling clock signal and the master bit clock signal (See Col. 5, lines 12-15). As mentioned in applicants' background discussion at Page 1, lines 20 – 26, PLLs suffer from various shortfalls when attempting to use them in devices which integrate several design technologies (e.g., different FPGA families, etc.).

Applicants point out that the present invention is constructing a new format of the AES/EBU serialized stream to use the same without circuits having PLLs.

Once again, the present principles are directed to extracting digital audio data words from a serialized stream of digital audio data (without the use of PLLs to establish clock signals) and using transition locations in the serialized stream, relative to a preamble sub-window and at least one data sub-window of a timing window that is constructed by the present principles. Thus, it is clear that the present principles is directed to different problem (i.e., not using PLLs due to their inability to integrate with other design technologies) than Lew (i.e., synchronizing audio stream with each other), and performs the solution to this different problem in a completely different way than the teachings of Lew.

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Applicants understand that the Office Action is confusing the invention of the present principles and the AES/EBU standard format, on which the present principles can be applied. Figure 2 of Lew shows a depiction of the standard ASU/EBU format. Col. 4, lines 34 – 64 describes this known format and its components.

In this response, in an attempt to provide further clarity, applicants have amended "transition window" to read "timing window" as set forth in the originally filed application (See Specification at Page 14, lines 3-22). No new matter has been introduced by this amendment.

Applicants' independent claims 1 and 11 recite, *inter alia*: The construction of a timing window from an estimated bit time for said serialized stream...; The extracting of plural digital audio data words from the serialized stream based upon the location of each transition....relative to said preamble sub-window and the at least one data sub-window of the timing window; and where each of the extracted digital audio data words has a preamble that is identifiable by a combination of at least one transition located in the preamble sub-window of the timing window and at least one transition located in the at least one data sub-window of the timing window. Lew fails to disclose, anticipate or remotely suggest these aspects of the claimed invention.

Lew describes, in Figure 2, the standard AES/EBU format. In order to prevent any further mis-interpretation of Lew, applicants reproduce the same here (Col. 4, lines 34- 68):

"The standard and well known AES/EBU format is illustrated in FIG. 2. In the conventional AES/EBU format, a left and right channel of analog audio signals, such as stereo audio signals, are sampled simultaneously at a sampling rate on the order of 44.1 kHz. A single left channel sample is typically encoded into up to 24 bits and contained in field 30 in a first subframe, and a single right channel sample is typically encoded into up to 24 bits and contained in field 32 in a second subframe. The first and second subframes form a single frame of digital audio information so that 44,100 frames per second effectively provide a digital representation of the stereo analog signals. The serial digital data is then biphase modulated (known as a Manchester family coding scheme) before

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transmission in order to enable synchronization and clock extraction from the data stream itself. Given digital signals in this AES/EBU format, well known and conventional techniques are used to decode these digital signals to reproduce the original analog audio signal.

'Additional bit fields are also provided in the AES/EBU format which perform various well known functions. Referring to FIG. 2, preamble fields 34 and 36 provide synchronizing and identifying preambles for digital audio fields 30 and 32, respectively. The preambles are used for identifying the start of a first or second subframe and the start of a block of frames (i.e., 192 frames). One-bit fields 38 and 40 contain a validity bit to indicate whether the audio sample is valid or defective. One-bit fields 41 and 42 contain a user bit to convey any information desired by the user. One-bit fields 43 and 44 contain a channel status bit, which are combined in a block of frames to convey various system parameters. One-bit fields 45 and 46 contain a parity bit to enable the simple detection of transmission errors."

Col. 6, lines 16-32:

"The demodulated digital data outputted by digital PLLs 62 and 64 is then applied to decoding circuitry 70 and 72 for separating digital audio information within each sample from control information and converting the digital audio information into parallel form, which is more desirable for subsequent digital processing. Circuitry for performing such decoding of AES/EBU format signals is well known in the field. Each sample of digital audio information in parallel form is then outputted onto the appropriate one of buses 73 and 74. Clocking information for performing such decoding by circuitry 70 and 72 is obtained from the subframes' synchronizing preambles and bit transitions themselves. The clock signals conventionally applied to decoding circuitry 70 and 72 and to other circuitry are not shown in FIG. 3 for simplicity; however, one of ordinary skill in the art will be aware of such clocking input signals."

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Applicants have reviewed the Examiner's position as stated on pages 3 and 4 of the office action dated February 14, 2008 and respectfully requests reconsideration of your position in view of this response. Initially, the Examiner takes the position that a window and a frame have the same function and are equally effective. Applicants respectfully point out that the method of extracting digital audio words from a serialized stream, according to the present principles, includes the constructing of a timing window that is not part of the serialized stream of digital audio data from which the audio is being extracted.

The newly constructed timing window of the present principles is built from "estimated bit times" for the serialized stream. There is nothing in the disclosure of Lew that discusses the use of estimated bit times for the decoding of the AES/EBU stream. The cited portions of Lew discuss the standard AES/EBU stream format, and nowhere in the discussion relating to the parts of the stream is there a remote suggestion of applicants' concept of using estimated bit times for constructing a timing window related to the stream.

The Examiner points to the other various bits (e.g., validity, user, channel status and parity) and the location of these bits as rendering how data can be extracted from a signal, in addition to providing synchronization. The bit fields are described by Lew as:

"...preamble fields 34 and 36 provide synchronizing and identifying preambles for digital audio fields 30 and 32, respectively. The preambles are used for identifying the start of a first or second subframe and the start of a block of frames (i.e., 192 frames). One-bit fields 38 and 40 contain a validity bit to indicate whether the audio sample is valid or defective. One-bit fields 41 and 42 contain a user bit to convey any information desired by the user. One-bit fields 43 and 44 contain a channel status bit, which are combined in a block of frames to convey various system parameters. One-bit fields 45 and 46 contain a parity bit to enable the simple detection of transmission errors."

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The preamble of applicants' claimed constructed timing window is identifiable by "...a combination of at least one transition located in said preamble sub-window of said timing window and at least one transition located in said at least one data sub-window of said timing window." It is respectfully asserted that Lew fails to anticipate, or even remotely suggest this feature of applicants' claimed invention. According to Lew, the preamble fields 34 and 36 provide synchronizing features, and are clearly not formed by a combination of different elements of the constructed timing window.

In view of the fact that Lew fails to disclose or suggest the construction of a new timing window from the AES/EBU stream, and that the PLL processing of Lew does not utilize bit transitions for anything other than synchronizing functions (See Col 5, lines 12-15), Applicants assert that Lew clearly fails to anticipate the constructing and extracting performed by applicants' claimed invention, as set forth in independent claims 1, 11 and 20.

In view of the foregoing, it is respectfully submitted that Lew does neither anticipate, nor renders obvious the teachings of the present principles, and particularly the claimed subject matter in independent claims 1, 11 and 20.

Claims 2-4, 8, 15-18 and 22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Lew in view of U.S. Patent No. 4,837,831 to Gillick et al.

Claims 5-7 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Lew in view of U.S. Patent No. 4,837,831 to Gillick et al. and in further view of U.S. Patent No. 5,490,130 to Akagiri.

Claims 9-10 and 19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Lew in view of U.S. Patent No. 4,837,831 to Gillick et al. and in further view of U.S. Patent No. 7,180,892 to Tackin.

Claims 2-10 depend from claim 1, claims 12-19 depend from claim 11 and claims 21-22 depends from claim 20. In view of these dependencies and the above-identified distinctions between Lew and the independent claims 1, 11 and 20, it is believe these claims are allowable for at least the reasons cited above with respect to the independent claims.

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In view of the foregoing, Applicants respectfully request that the rejections of the claims set forth in the Office Action of February 14, 2008 be withdrawn, that pending claims 1-22 be allowed, and that the case proceed to early issuance of Letters Patent in due course. JUN 13 2008

It is believed that no additional fees or charges are currently due for this response. However, please charge the RCE fee of \$810 and also the \$120 fee for the Petition for the One Month Extension, and any other costs that may be due, to Deposit Account No. 07-0832.

Respectfully submitted,

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